

**REMARKS*****Generally***

The Office Action (the “OA”) rejects some claims under on a test for statutory subject matter that is without basis in the Constitution, statute, case law, or applicable regulations. Nonetheless, the claims of the present application meet the only aspects of this test that are asserted against them.

The OA takes Official Notice to reject some claims under 35 USC §103. In each case, the OA improperly takes notice of “facts” not capable of instant and unquestionable demonstration as being well-known. The undersigned hereby demands that the Office provide authority for all “facts” officially noticed in this case. Errors in the use of Official Notice are specifically pointed out in the sections of this Reply applicable to each use of Official Notice.

Even assuming that Official Notice was properly taken in each case, the OA fails to state a *prima facie* case of unpatentability under 35 USC §103 because, in each case, not all claim limitations are addressed by the references and the noticed “facts.” Further, in each case where claims are rejected under 35 USC §103, the OA does not indicate teaching, suggestion, or motivation to combine those elements that it does find.

This Reply uses:

- underline and ~~strikeout~~ when citing corrected claim language in the body of the Reply;
- *Italics* when quoting the application;
- Courier when quoting the OA; and

Courier underlined when quoting a reference.

***Regarding Claim Objections***

Per the Examiner's recommendation, Claim 24 has been amended to correct the word *cat* to *cast*; Claims 15, 13, 19, and 27 have been amended to replace the word *individual* with the word *voter*. Please note that the specification states the following regarding "individual," "voter," "client," and "user":

*[0019] As described herein, the terms "individual", "user", "client", and "voter" are used interchangeably ...*

In addition, the word "secret" has been replaced with the word "private" in Claims 1, 13, and 14 to facilitate the discussion regarding claim rejections. Please note that the specification states "secret" and "private" interchangeably throughout.

***Regarding Claim Rejections under 35 U.S.C. §101***

In rejecting Claim 1 through Claim 14 under 35 U.S.C. §101, the OA asserts an inappropriate "two prong" test without citing authority for the test. The OA asserts:

The basis for this rejection is set forth in a two-prong test of: whether the invention is within the technological arts; and whether the invention produces a useful, concrete, and tangible result.

It is not apparent that this test is based on statute, case law, or regulation. Also it is not clear what the Examiner means by "technological arts." The undersigned consulted statute, applicable case law, 37 CFR, the Manual of Patent Examining Procedure (MPEP), and the PTO's own training materials regarding 35 USC 101 – none of which call for the test applied by the Examiner.

Assuming the test is valid, the claims nonetheless pass the test. The only criteria applied to reject Claims 1-14 under 35 U.S.C. §101 is:

... all of the recited steps can be performed in the mind of a user or by use of paper and pencil.

It is not true that all of the recited steps can be performed in the mind of the user or by use of paper and pencil. None of the following, each a portion of the invention of Claim 1, Claim 13, and Claim 14 (the independent claims in the rejected set), can be performed in the mind of a user or by use of paper and pencil:

*delivering an electronic ballot*

*creating a set of ballot choices that are digitally signed using the individual's ~~secret~~  
private key;*

*delivering the ballot choices with the individual's electronic signature ... to the server;  
and*

*creating a data element from the individual's electronic signature ... the server's  
electronic signature*

A mind of a user, or pencil and paper, cannot deliver, create, or electronically sign an electronic data element.

The OA acknowledges that the recitation of a network in the preamble would confer statutory subject matter if there is a positive recitation in the claim as a whole of:

*... structure or functionality to suggest that a computer performs the recited steps.*

Clearly the recitation in each independent claim of an electronic ballot, creation of ballot choices that are digitally signed, delivery of ballot choices that bear electronic signature, and creation of data elements bearing electronic signature, along with the recitation in the preamble of voting over a network, does much more than merely suggest that a computer performs the recited steps. Further, dependent claims introduce the following steps:

*transmitting (Claim 2)*

*recomputing (Claim 5)*

*storing ...and reading using a portable storage device (Claim 6)*

*such a smart card (Claim 7)*

*creating an election voter table at the server (Claim 10);*

*delivering and filling in a ballot that is a bit map (Claim 11), and*

*an HTML document or XML document (Claim 12).*

The undersigned requests that the Office withdraw the rejection as lacking legal basis; or the Office identify a legal basis (constitution, statute, case law, regulation) that requires the asserted two-prong test. If the Office can justify the legal basis for the asserted test, the undersigned requests that either the rejection be withdrawn, or the Office provide an explanation (and not a mere assertion) as to:

- how the recited steps can be performed in the mind of the user or by use of paper and pencil; and
- how the repeated recitation of the creation and delivery of electronic and digital elements over a network does not suggest that a computer performs the recited steps.

***Regarding Claim Rejections under 35 USC §103***

**Regarding Claims 1 and 15 as Unpatentable Over Karro**

**The OA fails to account for all elements of the claim.** The invention as claimed in Claim 1 requires a set of *ballot choices that are digitally signed using the individual's secret private key*. Karro does not disclose, nor does the OA claim official notice of, the use of a voter's private key for signing a set of ballot choices. The OA refers to the following portion of Karro, which describes the use of the authenticator-generated public key by the voter.

The voter then signs the encrypted version of the desired vote using his/her signature key *s* and send them to the authenticator,... (Karro pg. 5, Voting Phase, Step 5)

The key *s* is earlier described by Karro as follows

The authenticator generates a unique pair of public/private keys for the ID it received, ... and sends the pair of the public key *s* and the ID to the registrar (emphasis added).

The “pair” sent by Karro is the set {**public key *s***, ID}. The present application claims use of the private key. For this reason, the undersigned requests that the rejection of Claims 1 and 15 as unpatentable over Karro be withdrawn.

**Regarding Claims 2, 5, 16, and 19 as unpatentable over Karro in view of Official Notice.**

**The Official Notice is improper.** -- The MPEP offers the following guidance at §2144.04 regarding when it is not appropriate to take official notice:

It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well-known are not capable of instant and unquestionable demonstration as being well-known. (emphasis in the original)

The OA “notices” two “facts” with regard to Claims 2, 5, 16, and 19:

- signing the voting record is an obvious design choice, and
- sending the signed record is an obvious means for enabling a user to keep a copy of his vote.

The OA states the wrong criteria for taking official notice. The criteria is not whether a “fact” is “obvious”, but whether it is capable of instant and unquestionable demonstration as being well known. Taking official notice of elements missing from a reference is not an appropriate shortcut for finding all the elements (and a teaching, suggestion, or motivation to combine the elements) in a set of references.

Given that it is not appropriate to take official notice in this case, the undersigned is not required to traverse improperly taken notice. To require traverse in such a case would amount to inappropriate burden shifting where no *prima facie* case of unpatentability has been stated.

**If the Official Notice was proper, the OA still fails to establish a *prima facie* case of unpatentability under 35 USC §103.** The combination of Karro and the two officially noticed facts does not account for each element of the rejected claims, nor does it account for the teaching, motivation, or suggestion to combine (which teaching, motivation, or suggestion to combine is not susceptible to official notice) the elements from the references.

As an example of claim limitations not found in Karro-plus-official-notice, the claims require: *confirming the retention of the vote at the server by signing a specific set of data elements (i.e., a confirmation) and transmitting the signed confirmation to the individual who submitted the ballot.*

Karro does not disclose the data elements or signing by the server, . Karro discloses notifying an unauthenticated voter that he/she is not allowed to vote, and then teaches canceling the vote. Specifically Karro states:

8.... the authenticator passes only the legitimate encrypted vote ... to the counter. If authentication fails, the authenticator will notify the voter that he/she is not allowed to vote. The authenticator would then notify the registrar and distributor with a cancellation. 9. The voter's browser generates a receipt when the authenticator confirms receiving the ballot packets. (Karro pg. 5, Voting Phase, Step 8, Step 9)

Notifying ineligible voters that they are ineligible, having an authenticator confirm receiving a ballot packet, and having the voter's browser generate a receipt, does not disclose the invention as claimed. Adding the improperly noticed facts (signing the voting record, and sending the signed record for enabling a user to keep a copy of his vote) still fails to address the limitation cited above. Claims 2, 5, 16, and 19 specify certain types of signing and certain steps for verification not addressed by the OA. For these reasons, the undersigned requests that the rejection be withdrawn.

***Regarding Claims 3, 4, 17, and 18 as unpatentable over Karro***

With regard to Claims 3, 4, 17, and 18, the OA asserts:

... Karro et. al teach <a list of Karro system elements> to insure that the ballots have been cast, not tampered with and are accurately counted. ... Karro et. al further teach reconstruction of a ballot as a means for insuring the vote has not been tampered with as discussed above.

**The OA fails to address the specific limitations of the rejected claims.** A simple recitation of some of the objectives of Karro's technology (insuring untampered votes; accurately counting votes, in part through reconstruction of a ballot) is not a sufficient substitute for addressing the specific limitations of the claims. The OA does not address, and Karro does not disclose, the limitations of Claim 3 and Claim 17, e.g.:

*... recording in the data store the server's digital signature of the ballot <for> allowing verification at the server that all of the ballots cast have not been tampered with.*

The OA does not address, and Karro does not disclose, the limitations of Claim 4 and Claim 18, e.g.,:

*... verifying ... by*

*reconstructing the ballot for each individual using the vote serial number,*

*creating a digital signature over each reconstructed ballot by using the server's public key, and*

*verifying the digital signature against the ballot ... originally recorded when the individual created and submitted the ballot ...*

For this reason, and the reasons cited for the parent claims of Claims 3, 4, 17, and 18, the undersigned requests that the rejection be withdrawn.

***Regarding Claim 6 as Unpatenable Over Karro in View of Official Notice***

The OA asserts:

... Karro et al. teach the storage of the voter's encryption key on a portable storage device and reading the device prior to voting (floppy disk; Column 2, Page 4).

The relevant portion of Karro discloses:

The key *s* <the **public** key> may be valid for a long time ... it would probably be best to have the voter encrypt it ... the encrypted key (still denoted by *s* <and still the **public** key>) would be stored ... Voters just need to retrieve the key from their district, or floppy disk, before voting. (Karro col.2, page 4, comments added)

**The OA fails to address the limitations of the rejected claim.** Notice that the reference does not disclose storing *the individual's private encryption key, a certificate for the individual's public key and a voter identification generated when the individual registers with the system.* Each of these limitations is part of Claim 6, not addressed in the OA, and not disclosed in the reference. For this reason, , and the reasons cited for the parent claim of Claim 6, the undersigned requests that the rejection be withdrawn.

***Regarding Claim 10 as Unpatenable Over Karro***

With regard to Claim 10, the OA asserts:

... Karro et al. teach that the accuracy of an election depends on its ability to process/handle three types of votes invalid (ineligible voters), votes made by eligible voters but in incorrect formats and votes generated for unused ballots (Lemma 3, page 7). Karro et al. further teach the detection of attempts to cast more than one ballot ... (Voting Phase, Steps 6-7, Page 5; Announcement Phase, Page 51 Lemma 2, Page 7).

The cited section of Karro discloses:

6. The voter's Web browser informs the distributor that the ballot with the given ballot ID has been cast. (In so doing, the distributor has a record of how many votes are actually cast, and by which ballots. This will prevent any facility from generating votes for unused ballots, solving a major problem in many of the previously discussed protocols.) 7. The voter's Web browser informs the registrar that the voter has cast a vote, but it is not required to tell the registrar which ballot ID it used.

As with the rejection of Claim 3 above, **the OA fails to address the specific limitations of the rejected claims.** A simple recitation of some of the objectives of Karro's technology (accuracy and related vote types; detection of attempts to cast more than one ballot) is not a sufficient substitute for addressing the specific limitations of the claims. The OA does not address, and Karro does not disclose, these limitations of Claim 10:

*... creating an election voter table at the server from encrypted individual's voter identification; and*

*comparing each ballot to the encrypted individual's voter identification to detect if an individual attempts to cast more than one ballot.*

The referenced sections of Karro do not disclose use of an encrypted voter identification in the claimed fashion, nor do they disclose any procedure for checking for duplicate ballots. For these reasons, and the reasons cited for the parent claim of Claim 10, the undersigned requests that the rejection be withdrawn.



***Regarding Claims 11 and 25 as Unpatentable over Karro in View of Official Notice***

First, see remarks directed to the rejection of the parent claims of Claim 11 and Claim 25.

Second, **the Official Notice is improper** (see the reference to the MPEP regarding Official Notice in the remarks directed to the rejection of Claim 2 above).

The OA “notices” two “facts” with regard to Claims 2, 5, 16, and 19:

- representation ... of a document as an image ... is old and very well known in the art, and
- corrupting an image is more difficult than corrupting plain text and therefore provides an additional level of security

The OA goes on to assert that it would have been obvious to exploit the noticed “facts.” These “facts” are not such that they were subject to instant and unquestionable demonstration at the time of the invention. Further, taking official notice of elements missing from a reference is not an appropriate shortcut for finding all the elements (and a teaching, suggestion, or motivation to combine the elements) in a set of references.

Given that it is not appropriate to take official notice in this case, the undersigned is not required to traverse improperly taken notice. To require traverse in such a case would amount to inappropriate burden shifting where no *prima facie* case of unpatentability has been stated.

Third, **if the Official Notice was proper, the OA still fails to establish a *prima facie* case of unpatentability under 35 USC §103.** The combination of Karro and the two officially noticed facts does not account for each element of the rejected claims, nor does it account for the teaching, motivation, or suggestion to combine (which teaching, motivation, or suggestion to combine is not susceptible to official notice) the elements from the references. The noticed “facts” do not relate to *ballots* as claimed. The only material of record that relates the facts to ballots, and recognizes the utility thereof, is the application itself.

For these reasons, and the reasons cited in remarks directed to the parent claims, the rejection of Claims 11 and 25 should be withdrawn.

***Regarding Claims 12 and 26 as Unpatentable over Karro***

See remarks directed to the rejection of Claims 1 and 15.

***Regarding Claim 13 as Unpatentable over Karro***

See remarks directed to the rejection of Claims 1, 2, and 5.

***Regarding Claim 14 as Unpatentable over Karro***

See remarks directed to the rejection of Claims 1, 3, and 4.

***Regarding Claim 24 as Unpatentable over Karro in View of Official Notice***

The OA admits that:

Karro ... does not teach the use of a one-way hash function as a means for identifying individuals who attempt to cast more than one vote.

The OA then relies on Official Notice to find the missing elements of the claimed invention.

First, see remarks directed to the rejection of parent Claim 15.

Second, **the Official Notice is improper** (see the reference to the MPEP regarding Official Notice in the remarks directed to the rejection of Claim 2 above).

The OA notices one “fact” with regard to Claim 24:

- ... one-way hash functions are widely used for data integrity ...

The OA goes on to assert that it would have been obvious to exploit the noticed “fact.” This “fact” is not such that it was subject to instant and unquestionable demonstration at the time of the invention. Further, taking official notice of elements missing from a reference is not an appropriate shortcut for finding all the elements (and a teaching, suggestion, or motivation to combine the elements) in a set of references. Given that it is not appropriate to take official notice in this case, the undersigned is not required to traverse improperly taken notice. To require traverse in such a case would amount to inappropriate burden shifting where no *prima facie* case of unpatentability has been stated.

Third, if the Official Notice was proper, the OA still fails to establish a **prima facie case of unpatentability under 35 USC §103**. The combination of Karro and the officially noticed fact does not account for each element of the rejected claims, nor does it account for the teaching, motivation, or suggestion to combine (which teaching, motivation, or suggestion to combine is not susceptible to official notice) the elements from the references. The noticed “fact” does not relate to *verification of ballots* as claimed. The only material of record that relates the noticed “fact” to verification of ballots in the fashion claimed, and recognizes the utility thereof, is the application itself. Neither Karro nor the noticed “fact” teaches, suggests, or provides motivation for the use of hash functions to verify ballots.

For these reasons, and the reasons cited in remarks directed to the parent claims, the rejection of Claim 24 should be withdrawn.

***Regarding Claim 27 as Unpatentable over Karro***

See remarks directed to the rejection of Claims 1, 2, and 5.

***Regarding Claim 28 as Unpatentable over Karro***

See remarks directed to the rejection of Claims 1 and 4.

***Regarding Claims 7, 8, 20, and 21 as Unpatentable over Karro in View of London Shrader***

See remarks directed to rejection of Claims 1-6, 10-19, and 24-28 above.

***Regarding Claim 22 as Unpatentable over Karro in View of London Shrader and Official Notice***

See remarks directed to rejection of Claims 1-6, 10-19, and 24-28 above.

***Regarding Claims 9 and 23 as Unpatentable over Karro in View of London Shrader and Sehr***

The only embodiments related to the use of “demographics” in Sehr uses a definition of “demographics” that is inconsistent with that used in the specification of the present application. Sehr discloses:

The demographics section includes data such as the voter's name, SSN (Social Security Number), and address. (Sehr, col. 3, lines 43-50)

The present application discloses:

*Optionally, demographic data could also be input into the election verification table 155 as long as this information would not, through inference or aggregation, divulge the voter's identity. (para. 72)*

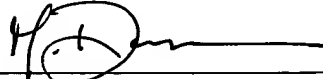
Clearly, any one of a voter's name, SSN, and address would explicitly (name, SSN), or could through simple inference (address), divulge the voter's identity. For this reason, the undersigned requests that this rejection of Claim 9 and Claim 23 be withdrawn.

**CONCLUSION**

With consideration of the above remarks, the undersigned submits that this application is in condition for allowance, and such disposition is earnestly solicited. If the Examiner believes that the prosecution might be advanced by discussing the application with the undersigned, in person or over the telephone, we would welcome the opportunity to do so.

Respectfully submitted,

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